



Wildfire near Red Lodge, Montana



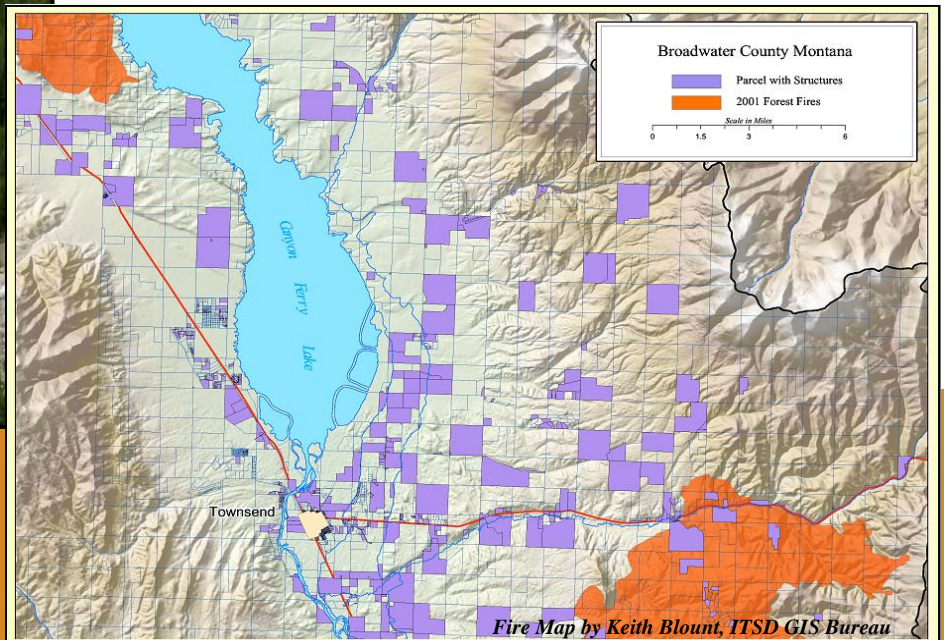
Cooney Dam Breach - Photo by Ted & Jodie Dinsdale of Roberts, Montana

**GIS helps responders  
know...**

**What is where and why  
we should care!**



Beartooth Highway landslide



Fire Map by Keith Blount, ITSD GIS Bureau

# GIS is about data and



2002 Montana Wildfires

*"Accurate mapping and intelligence is absolutely necessary to responder safety, population protection, and operational tactics during any incident. I use it [GIS] on a daily basis in my volunteer Fire Chief position and it is critical we get timely, accurate, and integrated information to utilize..."*

*- Bob Fry  
Park County, Montana*

## Montana Critical Infrastructures/Structures GIS Working Team of DES

Since 2002 the Montana Critical Infrastructures/Structures Geographic Information Systems (GIS) Working Team of DES has been working to coordinate geographic information related to critical infrastructure in the state of Montana. Critical infrastructure can be defined as those structures and systems that are so vital that

their incapacity or destruction would have a debilitating impact on the defense and economic security of the

United States. Critical infrastructure is one layer in the Montana Spatial Data Infrastructure (MSDI) — representing an ongoing effort to develop standardized and seamless GIS data layers for the state. The goal of the Working Team is to integrate this layer into the business practices of the DES community. The Team has succeeded in the creation of the following layers: airports, emergency facilities, agricultural (fertilizer/pesticides) stores, pipelines, power lines, and hospitals. The capture of these data is pioneering and vital to the future safety of the state and its citizens.

## Critical Infrastructure & Structures Data Model

*How do we identify people to warn or evacuate during an emergency?*

*Where are hazardous materials located?*

*What is threatened by a failing dam?*

The Critical Infrastructure & Structures Data Model (CISDM), "SysDem", will aid the DES community in answering these questions. Critical infrastructure data are defined as all of the geospatial data needed for emergency response situations.

Currently the CISDM includes the following emergency facility features: Police Stations, Fire Stations,

Ambulances, Emergency Operations Centers, Shelters, Hospitals, etc. It will carry more statewide data as time goes by. An important priority exists in that many of the feature data need to be validated by each of the local providers. Outreach to each DES entity is ongoing and will achieve 100% validation by the end of summer 2006.

The maps, images, and the supporting data portal are CISDM products that will be provided to each DES manager and represent an important integration of GIS into DES. Through these products, the CISDM will provide the geographic information you need, even if you do not have GIS software at your disposal!

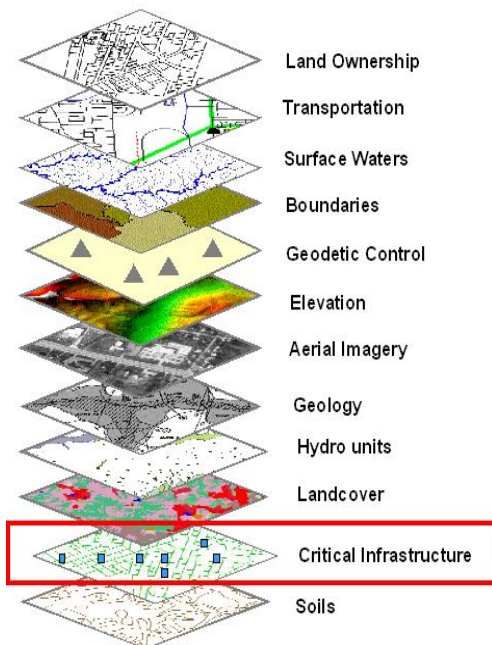
CISDM was developed with the Office of Domestic Preparedness, Homeland Security Program grant funds to make certain that GIS data will be ready the next time disaster strikes!

*"Information and intelligence are two critical factors to an effective response and recovery effort during emergency and disaster situations. The GIS team embarked on a journey that has raised interest nationally regarding their proactive design model [CISDM] and their efforts will have a considerable impact on the emergency management approach in our great state."*

*- Dan McGowen  
Montana DES Administrator*

## CISDM is Collaborative

The CISDM is a GIS data container that stores information about critical structures. In many cases, the data already exists and needs only to be requested from



Montana Spatial Data Infrastructure (MSDI)

# the mapping of where!

the local providers. These datasets are loaded into the database through a collaborative effort involving dataset identifiers. Many of the DES Pre-Disaster Mitigation Plans already have GIS maps detailing critical structures. To avoid redundancy of effort the Team will work with DES to obtain those data.

*"GIS began its integration into emergency management just a few years ago. Although GIS has long provided valuable management products and tools, it is now richly enhancing our capabilities in all phases of emergency management."*

*- Steve Knecht*

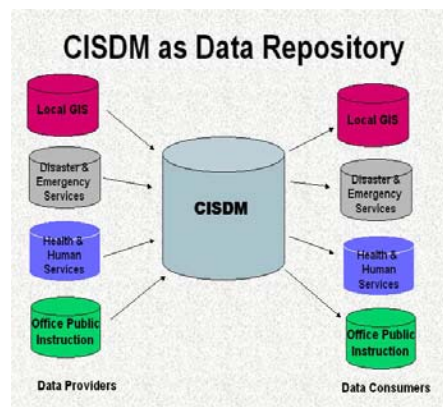
*Montana DES Response Manager*

Agreements already exist with other agencies and have been instrumental in the capture of the following:

- Department of Natural Resources & Conservation (DNRC) - Dam inundation maps. For many years there have existed paper maps that illustrate the effected areas given a dam failure of the high hazard dam sites in the state. The DNRC has collaborated with the Working Team to digitize these maps. This enhancement represents an opportunity to use GIS with reverse E-911 applications to warn communities about imminent dangers.
- Risk Management & Tort Defense Division (RMTD) - State Structures. RMTD is responsible for the tort defense and risk analysis for the state properties. They have realized the need for geographic information about the State properties. A pilot

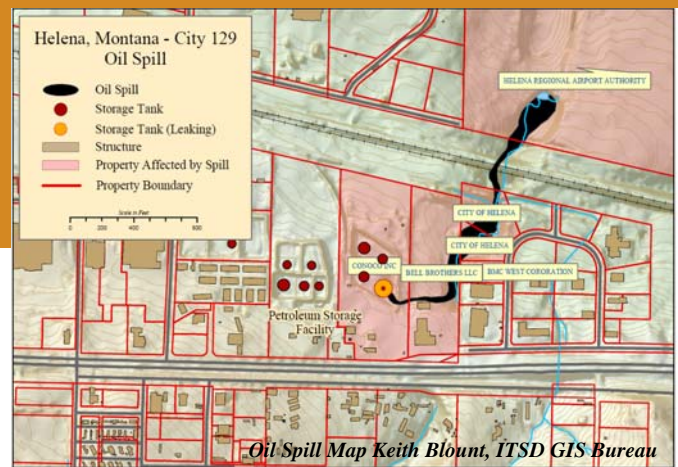
project has begun to capture these structures for CISDM and RMTD purposes.

- Office of Public Instruction (OPI) – Schools. The location of schools is of paramount importance to school administrators, planners, and emergency responders alike. The schools collected for the CISDM and the physical addresses carried by OPI will be combined to represent the schools most accurately for both entities in a GIS.



## ***CISDM is Multi-Jurisdictional***

The database will contain datasets from a multitude of sources including Federal, Tribal, State, local, and private providers. The collection and maintenance of these datasets is the responsibility of the CISDM Data Coordinator, Eric Eidswick of the Montana Department of Administration. The use of so many different datasets from such a wide range of providers represents a challenge. The challenge is to keep all the data current. The solution is to leverage the best available data from local providers and engage them as both data producers and consumers



## ***CISDM is Compatible***

The CISDM is designed to conform with current federal programs focusing on critical infrastructures and related topics. These programs include:

1. Homeland Security Infrastructure Program (HSIP): The CISDM provides a table that relates CISDM feature function names to HSIP categories and sectors.
2. National Incident Management System (NIMS): The CISDM provides a table that relates CISDM feature function names to NIMS categories.
3. The National Map (TNM): The CISDM provides a table that relates CISDM feature-function names to TNM categories and sectors.

*"At a time when disaster management is so important, Montana has taken a strong lead in developing a Critical Infrastructure Data Model that will help solve problems related to security and response using GIS. While there is no 'absolute data base design' that covers all aspects of homeland security, Montana provides a solid example of a solution that uses the strength of GIS, supported by a good data model design, to meet and exceed the criteria set by the nation."*

*- Jack McCarthy  
ESRI*

# *Geographic Information Systems...not just a pretty map.*

## **GIS is state-wide**

State maintained GIS data is an invaluable resource for many people in Montana. The availability of seamless and easily accessible geographic information is fast becoming a necessity to many business processes in operation today. Whether your business is real estate, emergency response, wildfire mitigation, water/wastewater management etc., chances are that GIS can play a role in your daily operations. The Framework Layers that are being compiled today offer standardized GIS data and are updated by the state in cooperation with the local governments.

These layers are available to all users, including: government agencies, private businesses, and Montana citizens.

The Montana Critical Infrastructures/Structures GIS Working Team of DES is leading the way in the development of one such layer with the Critical Infrastructure & Structures Data Model (CISDM), a statewide critical structures

data repository. This group's efforts are being recognized on a national level for their vision. Once this framework layer is deployed, it will ensure that geographic information will be at the ready next time disaster strikes. This means improved response time and better protection for you and your family.



Rescue workers use GIS and GPS for search and recovery of Hurricane Katrina Survivors in New Orleans, LA.

shuttle Columbia, the Asian tsunamis of 2004, and the recent Hurricanes Katrina and Rita in the Gulf States. As these disasters occur, the need for current and accurate GIS data is becoming more pronounced.

Having geographic data at the ready, in an accessible format, does not happen overnight. The Montana DES recognizes this and has been actively pursuing a data solution that will support GIS and emergency response during any incident — anywhere in the state. This data solution is the CISDM and its products including: data access portal, hard copy maps, and DVD's of emergency facility data and imagery.

## **GIS is an invaluable tool**

The use of GIS for emergency response, planning, and recovery is becoming prevalent at all levels. From local to national incidents, the use of geospatial technologies are in demand by directors and incident commanders alike. The power of this technology has been demonstrated during recent events such as the explosion of space

**To learn more about the CISDM contact Eric Eidswick, (406) 444-2793, [eeidswick@mt.gov](mailto:eeidswick@mt.gov)**

**To learn more about the Montana Critical Infrastructures/Structures GIS Working Team of DES please contact Randy Middlebrook or Jens Bolstad at (406) 841-3911 or**

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